

wherein the reflector is formed of a ceramic having a thermal conductivity of at least about 0.005 (cal/cm·sec·deg) at a temperature of 20°C.

The claimed invention is also, as recited in Claim 7, a projector, comprising an illuminating optical system including the above light source device; an electrooptic device that modulates light emitted from the illuminating optical system in response to image information; and a projection optical system that projects a modulated light obtained by the electrooptic device.

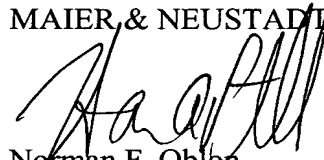
The rejection of Claims 1-13 under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,621,267 (Shaffner et al), is respectfully traversed. As shown by the Kyocera data sheet and English translation thereof (3 total pages) **submitted herewith**, alumina can have various thermal conductivities according to its content (%) and appearance. Porous alumina (e.g., No. A-410 or No. A-432) has a thermal conductivity of 0.004 cal/cm·sec·deg at 20°C. Thus, it is **not** inherent that alumina has a thermal conductivity of at least 0.005 cal/cm·sec·deg at 20°C. As the Examiner notes, Shaffner et al discloses a high-power metal halide reflector lamp wherein the lamp contains a ceramic reflector made of alumina, i.e., Al₂O₃. Shaffner et al discloses a cast reflector (column 3, lines 8-10, Fig. 3 and column 3, lines 56-58). The cast reflector has a rough inside surface (column 3, lines 10-15) and is almost completely comprised of alumina. Thus, it is respectfully submitted that this reflector, like above No. A-410, is formed of porous alumina having a relatively small thermal conductivity, i.e., less than 0.005 cal/cm·sec·deg at 20°C. Nor would it have been obvious, without the present disclosure as a guide, to use an alumina in Shaffner et al meeting the presently-recited thermal conductivity limitation.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER, & NEUSTADT, P.C.



Norman F. Oblon
Attorney of Record
Registration No. 24,618

Harris A. Pitlick
Registration No. 38,779

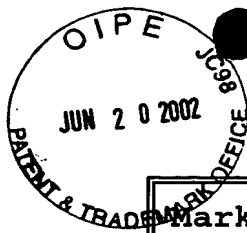


22850

(703) 413-3000
Fax #: (703) 413-2220
NFO:HAP:kst

I:\atty\HAP\198538us-am.wpd

198538US-0



Marked-Up Copy
Serial No: 09/691,032
Amendment Filed on: HEREWITH

RECEIVED
JUN 28 2002
TECHNOLOGY CENTER 2800

IN THE CLAIMS

--3. (Amended) A light source device in accordance with claim 2, wherein the ceramic is composed of any material selected from the group consisting of Al_2O_3 , $2\text{MgO}\cdot\text{SiO}_2$, $\text{MgO}\cdot\text{SiO}_2$, $\text{ZrO}_2\cdot\text{SiO}_2$, TiO_2 [compounds], SiC , Si_3N_4 , ZrO_2 , and cermet.

9. (Amended) A projector in accordance with claim 8, wherein the ceramic is composed of any material selected from the group consisting of Al_2O_3 , $2\text{MgO}\cdot\text{SiO}_2$, $\text{MgO}\cdot\text{SiO}_2$, $\text{ZrO}_2\cdot\text{SiO}_2$, TiO_2 [compounds], SiC , Si_3N_4 , ZrO_2 , and cermet.

Claims 14-31 (New).--

Appendix 2

[illegible]

Item \ Material		ALUMINA (Al ₂ O ₃)														
KYOCERA No.		A-410	A-420	A-430	A-432	A-433 (A-238)	A-56	A-61	A-150	A-201 (A-201B)	A-440	A-442	A-445	A-459	A-460	A-473
Appearance		Porous														
Color		White	White	Black	White	White (Russet)	White	Black	several	White (Russet)	Dark violet	Dark brown	Dark brown	Russet	Russet	White
Alumina Content (%)		99.9	-	-	-	99.7 (99.7)	99.7	-	-	98	90	76	91	90	96	92
Main Characteristics		degreasing facility, high insulation	high heat resistance	oil impregnation	heat resistance, high insulation	good surface smoothness	high mechanical strength at high temperature	hard, good thermal conductivity	glossy, translucency	good surface smoothness	light intercepting, good metalization	conductive	light intercepting, high heat dissipation	high heat resistance	high wear resistance	good metalization, high mechanical strength
Main Applications		electronic tube cathode, tube, heater insulating tube	seal and component for fireproof	oil roller	electronic tube heat resisting component	thread guide	cutting tool	cutting tool, wear resistant component	ornament	thread guide	IC package, display tube	slidable component	IC package, transistor header, display tube	burner nozzle	thread guide	IC multi- layer package, electronic tube component, wear resistant component
Bulk Specific Gravity		-	2.4	2.9	2.5	2.4	3.9	3.9	4.1	4.0	3.8	3.6	3.7	3.9	3.6	3.8
Water Absorption		%	5-15	5-20	5-15	10-15	0	0	0	0	0	0	0	0	0	0
Mechanical		Vickers Hardness	Kg/mm ² (load 500g)	-	-	-	1,750	2,100	2,300	1,800	1,600	1,300	1,000	1,100	1,300	1,600
Characteristic		Flexural Strength	Kg/cm ²	650	500	700	600	3,500	5,400	7,500	3,200	2,900	2,800	1,800	2,100	2,900
		Compressive Strength	Kg/cm ²	-	-	-	-	26,000	40,000	45,000	-	-	-	-	-	-
		Young's Modulus	Kg/cm ² (×10 ⁶)	-	-	-	-	3.8	3.9	3.8	3.9	3.6	-	-	-	-
		Poisson's Ratio	-	-	-	-	0.19	-	-	-	0.20	-	-	-	0.30	0.21
Thermal		Coefficient of Linear Thermal Expansion	1/°C (×10 ⁻⁶)	6.8	6.5	7.0	6.8	6.8	-	-	6.8	7.0	7.1	7.2	7.0	6.7
Characteristic		Thermal Conductivity	cal/cm/cm ² ·sec·°C	0.004	-	-	0.004	0.07	0.07	0.08	0.07	0.06	0.04	-	0.04	0.06
		Specific Heat	cal/g·°C	-	-	-	-	0.19	0.19	0.17	0.19	0.19	0.20	-	0.19	0.20
		Maximum Working Temperature	°C	1,600	1,600	1,000	1,600	1,750	-	-	-	1,650	1,500	1,200	1,200	1,500
Electrical		Dielectric Strength	KV/mm	10	-	-	10	-	-	-	10	-	10	10	10	10
Characteristic		Volume Resistivity	Ω·m	>10 ¹⁴	-	-	>10 ¹⁴	-	-	-	10 ¹⁴	10 ⁸	10 ¹²	10 ¹⁴	-	>10 ¹⁴
				300°C	-	-	10 ¹³	-	-	-	10 ⁹	-	10 ⁸	10 ¹²	-	10 ¹³
				500°C	-	-	10 ¹⁰	-	-	-	10 ⁷	-	10 ⁷	10 ⁹	-	10 ¹⁰
		Dielectric Constant (1MHz)	-	5.0	-	-	-	-	-	-	-	-	-	-	8.5	-
		Dielectric Loss Angle (1MHz)	(×10 ⁻⁴)	-	-	-	-	-	-	-	-	-	-	-	3	-
		Loss factor	(×10 ⁻⁴)	-	-	-	-	-	-	-	-	-	-	-	25	-
Chemical		Nitric Acid (60%) 90°C	-	-	-	-	-	-	-	-	-	-	-	-	-	0.32
Characteristic		Sulfuric Acid (95%) 95°C	-	-	-	-	-	-	-	-	-	-	-	-	-	0.65
		Caustic Soda (30%) 80°C	-	-	-	-	-	-	-	-	-	-	-	-	-	0.91

Single Crystal SAPPHIRE											
A-476	A-479	A-479SS	A-480	A-482 (A-482P)	A-484	A-486	A-490	A-500	SA-100		
				Porous					Dense		
White	White	White	Ivory	White (pink)	White	Russet	White	White	Transparent		
96	99	99.5	99.8	76	93	96	99.5	98	99.9		
good surface smoothness, good printing	hard, chemically stable	hard, chemically stable, high wear resistance	hard, chemically stable, high mechanical strength	high heat resistance	high wear resistance	high heat resistance	good surface smoothness	good surface smoothness	high mechanical strength, high heat resistance, chemically stable, high frequency insulation, high transparency (transparent)		
substrate for and hybrid IC thick film	heat, wear corrosion resistant component	wear resistant, corrosion resistant component, slider	heat resistant, corrosion resistant component	welding nozzle, nozzle for glass fiber	slidable component, capstan	burner nozzle	substrate for hybrid IC thin film	thread guide	SOS substrate, window for high-temperature and high-pressure device, structure component, physicochemistry device component		
3.8	3.8	3.8	3.9	3.6	3.6	3.8	3.8	3.7	3.97		
0	0	0	0	0.6	0	0	0	0	0		
1,500	1,650	1,800	1,800	1,000	1,400	1,600	1,600	1,600	2,300		
2,800	3,100	3,300	3,200	1,600 (2,000)	3,100	3,300	2,800	4,000	7,000		
-	22,000	24,000	-	-	-	-	-	25,000	30,000		
3.2	3.5	3.7	3.8	-	3.0	3.5	-	4.0	4.8		
0.23	0.25	0.23	0.19	-	0.25	-	-	-	-		
7.1	7.1	7.1	6.8	6.4 (6.0)	6.8	6.8	6.8	7.0	5.3		
7.8	7.9	7.9	7.8	7.1	7.7	7.7	7.7	7.9	4.5		
0.05	0.06	0.06	0.07	0.02	0.04	0.05	0.06	0.07	0.1		
0.19	0.19	0.19	0.19	0.18	0.19	0.19	0.19	0.19	0.18		
1,600	1,600	1,600	1,750	1,500	1,500	1,600	-	1,500	2,000(melting point 2,050°C)		
10	10	-	-	-	-	-	10	-	-		
>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	-	>10 ¹⁴	-	>10 ¹⁴	-	10 ¹⁶		
10 ¹¹	10 ¹¹	-	-	-	-	-	10 ¹⁴	-	-		
10 ⁹	10 ⁹	-	-	-	-	-	10 ¹¹	-	-		
-	9.7	10.2	-	-	-	-	9.7	-	(10 ³ -10 ¹⁰ Hz 25°C)		
-	2	-	-	-	-	-	2	-	11.5		
-	19	-	-	-	-	-	19	-	9.3		
-	0.10	-	0.08	-	0.14	-	-	-	No 1.768		
-	0.33	-	0.32	-	0.34	-	-	-	Ne 1.760		
-	0.26	-	0.20	-	0.95	-	-	-	no less than 80% at 3,000Å-3,500Å		
									Optical Characteristic		
									refractive index		
									light transmittance		